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Perioperative Tactical Decision-Making (Profitability Analysis)

Perioperative tactical decisions include hiring more staff to expand OR capacity, purchasing capital equipment, building more ORs, supporting growth of a surgical group, and/or building a freestanding facility. *Increasing block time to a surgical group is an example of a tactical decision*. For a facility deciding whether more block time be allocated to a group of surgeons and, if so, how much more block time, then the relevant analyses are those described here. OR information systems and hospital accounting databases are combined for purposes of such tactical decisions.[1-6] Hospitals can use these methods to assist in achieving a sufficient operational margin to have capital for making improvements (e.g., new information technologies) and for providing uncompensated community benefits (e.g., teaching and indigent care).

Click here for a lecture describing the methodology. Click here for the abstract of the principal article describing this yield management and click here for a PDF of the full text:

> Dexter F, Ledolter J, Wachtel RE. Tactical decision making for selective expansion of operating room resources incorporating financial criteria and uncertainty in subspecialties' future workloads. Anesthesia & Analgesia 100:1425-1432, 2005.

For hospitals that are not located in metropolitan areas, tactical decisions rely on strong quantitative information about the potential to grow future inpatient workload. Click here for a PDF describing the methodology. Click here for the abstract of the article describing the combination of the analysis with federal web site data for estimating workload and click here for a PDF of the full text[7]:

> O'Neill L, Dexter F. Tactical increases in operating room block time based on financial data and market growth estimates from data envelopment analysis. Anesthesia & Analgesia 104: 355-368, 2007.

Some hospitals have been reluctant to make decisions based on financial criteria, out of concern that their managerial accounting data were inadequate. Nevertheless, variable costs can be estimated sufficiently accurately, for perioperative tactical decision-making, using operating room time, hospital length of stay, intensive care unit length of stay, and implant costs.[3] Hospitals with a detailed cost accounting system would, of course, instead use their directly measured variable costs. Either way, knowing each patient's implants and the implants' costs is necessary for the analysis.[3,8]

The revenue used in the analysis can be hospital reimbursement, hospital and professional reimbursement, and/or the "value" of each patient to the organizational mission. For example, a hospital using the analysis to decide how much OR capacity to contract for with an anesthesia group would include just hospital reimbursement. For example, a cancer hospital may include incremental "revenue" for each additional patient with cancer from a specified region who receives care at the hospital. For example, a hospital aiming to increase public exposure of its pediatric care may include incremental "revenue" for each additional child receiving care at the hospital.

Sub-specialty is represented by performing the analysis on a per surgeon basis. Surgeons' and/or sub-specialties' hospital contribution margins per operating room hour vary by more than 1000%.[1-4,6] This is why it is so important for organizations to determine differences among sub-specialties. Increasing operating room resources selectively is markedly advantageous financially versus increasing capacity equally. However, constraints from limited operating room, hospital ward, and/or

intensive care unit resources must be included in the decision-making.[2] That is why the analysis is performed not on a per patient basis, but per resource use basis. In addition, including the constraints assures that tactical decisions are consistent with what is operationally feasible. The constraints are considered mathematically by performing linear programming.[2] To ensure our clients can easily use the results, we do the work in Excel.

Decisions to change or maintain resources are highly uncertain for each surgeon or sub-specialty.[4] Reports simply listing each surgeon or sub-specialty in rank order of contribution margin are misleading.[4] Random error affects surgeons' measured financial performance sufficiently to affect decision-making.[4] Thus, we use the hospital accounting and operating room information system data to estimate the uncertainty, and report confidence intervals.[4] The uncertainty, in the estimated contribution margins, is incorporated into the final tactical decisions through the use of quadratic programming.[5] These are standard mean-variance portfolio analyses as used in financial calculations.

The product of the analysis is a spreadsheet estimating the financial impact of different potential tactical decisions. Typically, the initial work is presented during a two-hour web conference, feedback is obtained for desired "What if" analyses, additional analyses are performed, and a final spreadsheet report is sent by e-mail. The University charges $4000 for the analysis. This charge is relatively low since we developed the methodology, and have so much experience in applying our computer codes.

At some hospitals, a concern is why contribution margin per OR hour should be the basis for the tactical analysis, not OR utilization. Thus, a custom presentation is prepared on this topic. The PDF file is sent by E-mail. Click here for the abstract of a review article explaining why not to rely on OR utilization and click here for a PDF of the full text:

> Wachtel RE, Dexter F. Tactical increases in operating room block time for capacity planning should not be based on utilization. Anesthesia & Analgesia 106:215-226, 2008.

Profitability and tactical planning assessments are important, but generally have a large impact on decision-making by a small group (e.g., directors of surgical services and executives). Implementation tends to occur over several months. The challenges in using these methods are not organizational development (politics), but asking the right questions and getting the right mathematical answers from whatever data are available from a hospital and its professional groups.

References

(1) Anesth Analg 2001; 93:669-675 [PDF]

(2) Anesth Analg 2002; 94:138-142 [PDF]

(3) Anesthesiology 2002; 96:718-724 [PDF]

(4) Anesth Analg 2002; 95:184-188 [PDF]

(5) Anesth Analg 2003; 97:190-195 [PDF]

(6) Anesth Analg 2005; 100:1425-1432 [PDF]

(7) Anesth Analg 2007; 104:355-368 [PDF]

(8) Anesthesiology 2005; 103:161-167 [PDF]